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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/940,757 | 08/28/2001 | Yi Wei | CR00-046 | 5781 |

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MOTOROLA, INC.
CORPORATE LAW DEPARTMENT - #56-238
3102 NORTH 56TH STREET
PHOENIX, AZ 85018

EXAMINER

TRINH, MINH N

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

3729

DATE MAILED: 05/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/940,757

Applicant(s)

WEI ET AL.

Examiner

Minh Trinh

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 April 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 7-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2. 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. Applicants' election with traverse of Species 1A, drawn to Fig. 1 (claims 1-20), in Paper No. 4 is acknowledged. However, with respect to claims 7-20, these claims are directed to nonelected Species 1B, and are independent or distinct from elected Species 1A because of the following reasons:

a) Applicant is not entitled to examination of multiple independent inventions in one application. The species 1B, drawn to Fig. 4 read on claims 7-20 (see the discussion in the Office Action dated 3/20/2003, paragraphs 1-2), i.e. the claimed limitation of: "forming a plurality of electron emitters 13's (see Fig. 4) on the attachment site 12's " as recited in Species 1B which does not require by Species 1A (Note that Fig. 1, does not require a plurality of electron emitters 13's). If applicants traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

b) Applicants' response is not persuasive because the reasons proffered are not relevant to an election of species. The requirement for an election of species is found at Section 808.01(a) in the MPEP. Once claims are determined to be directed to mutually patentable inventions and the Office requires an election of species, a persuasive traverse is an admission on the record that Applicant did not demonstrate that the

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claimed species are individually patentable, Applicant's reasons therefore are not persuasive. Moreover, examination of the independent inventions herein would present a serious burden to the Office in as much as the searches are not coextensive and the art is quite prolific Accordingly, the requirement is repeated and made **FINAL**.

2. Claims 7-20 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected Species 1B, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. 4. An Office Action on the merits of claims 1-6 follows.

Specification

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: "Method for Making A Vacuum Microelectronic Device".

Abstract

4. The abstract of the disclosure is objected to because the scope of it is a vacuum microelectronic device, which does not describe sufficiently the claimed method invention. Appropriate correction required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 103

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5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Soclof (US 4,683,399) in view of Johnson et al (US 6,495,865).

Soclof discloses a method of forming a vacuum microelectronic device comprising: forming at least one electron emitter E on a substrate 10 (see Figs. 1-4a, col. 5, lines 1-40); applying a first electric field ϵ (see Fig. 4a) to move a portion of the at least one electron emitter in a direction toward the first electric field (see Fig. 4a, and the discussion at col. 6, lines 10-24). Soclof does not teach a step of maintaining the at least one electron emitter in the direction toward the electric field after removing the first electric field. Johnson et al teach a step of maintaining at least one electron emitter in the direction (see arrows) toward the first electric field after removing the first electric field (see arrows as present in Figs. 1 and 3). Therefore, it would have been obvious to one ordinary skill in the art, at the time of the invention to modify the device taught by Soclof by employing the teaching of Johnson's maintaining the electron emitter in the direction (= arrows) toward the first electric field after removing the first electric field in order to obtain a vacuum device with the at least one emitter electron associated therewith by using the techniques known in the art.

Note that the arrows direction of Johnson's Figs. 1, 3 and 5 broadly read on the direction toward the first electric field of the instant claims.

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7. Claims 3, 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Soclof (US 4,683,399) in view of Johnson et al (US 6,495,865).

As applied to each of claim 3-5, with respect to the process steps drawn to: "using a second electric field having a value that is less than the value of the first electric field" (as recited in claim 3); and the configuration between the second and the first electric field (as recited in claims 4-5). It would have been an obvious matter of design choice to choose any desired value for the first electric field and the second electric field since applicant has not disclosed that the claimed "a second electric field having a value that is less than the value of the first electric field" (as recited in claim 3); and the configuration between the second and the first electric field (as recited in claims 4-5) would solve any stated problem or is for any particular purpose and it appears that the invention would perform equally well with the associated electric field configurations as taught by the applied prior art (i.e., see the discussion at col. 5 thru col. 6 of Soclof).

Limitations of claims 4 and 5 are also met as set forth above.

8. Claims 2 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Soclof (US 4,683,399) in view of Johnson et al (US 6,495,865) as applied above and further in view of Goren et al (US 6,297,592).

As applied to claims 2 and 6, Soclof or Johnson et al, as modified and relied upon above do not teach the applying step includes applying the first electric field having a value of at least 0.2 –50 V/mA, and further including extracting a current from the at

least on e electron emitter wherein the electron emitter has an internal current density of at least $1 \times 10^4 \text{ A/cm}^2$ (as recited in claim 2); forming at least one nanotube emitter on the substrate (as recited in claim 6). Goren et al teach the applying step wherein applied electric field (= the first electric field) having a value in range of 0.2 –50 V/ μA (see Fig. 6, and the discussion at col. 4, lines 54-67, and col. 10, lines 8-11), and the extracting a current from the at least on e electron emitter wherein the electron emitter has an internal current density of about $1 \times 10^4 \text{ A/cm}^2$ (see the discussion in col. 4, lines 59-61), and the at least nonotube on the substrate (see col. 4, line 45). Therefore, it would have been obvious to one ordinary skill in the art, at the time of the invention to modify the device taught by Soclof or Johnson et al by employing the teaching of applying first electric field having a configuration value in range of 0.2 –50 V/mA, and the extracting a current from the at least one electron emitter wherein the electron emitter having an internal current density about $1 \times 10^4 \text{ Amp/cm}^2$ as taught by Goren et al in order to obtain a vacuum microelectronic device with the manufacturing electric field configuration, maximum emission efficiently would result.

Prior Art References

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Prior art references are cited for their teaching of method of manufacturing vacuum electron devices.

Conclusion

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10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Minh Trinh whose telephone number is (703) 305-2887.

The examiner can normally be reached on Monday -Thursday 8:00 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on (703) 308-1789. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-7307 for regular communications and (703) 305-3579 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1148.

A handwritten signature in black ink, appearing to read 'Minh Trinh', followed by a horizontal line extending to the right.

M. Trinh
Patent Examiner Group 3729

mt
April 28, 2003